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ABSTRACT

This document contains Illinois Occupational Skill Standards for occupations in the Information Technology Design and Build Cluster (technical writer, programmer, system analyst, network architect, application product architect, network engineer, and database administrator). The skill standards define what an individual should know and the expected level of performance required in an occupational setting. The standards focus on the most critical work performances for an occupation or occupational area. Each skill standard contains the following components: performance area, performance skill, skill standard, performance elements, and performance assessment criteria. Following an introduction that explains the standards and their components and includes a performance skill-level matrix, the document contains skill standards for the following areas: (1) analysis; (2) system design; (3) visual design; (4) functional design; (5) multimedia production and acquisition; (6) development; (7) testing; (8) implementation; (9) education and training; (10) documentation; and (11) project management. Six appendixes include glossaries of information technology terms and occupational skill standards terms; lists of members of the Illinois Occupational Skill Standards and Credentialing Council, the Communications Subcommittee, and the Information Technology Design/Build Cluster Standards Development Committee; and workplace skills standards. (KC)

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ILLINOIS

OCCUPATIONAL SKILL STANDARDS

INFORMATION TECHNOLOGY DESIGN/BUILD CLUSTER

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ILLINOIS OCCUPATIONAL SKILL STANDARDS

INFORMATION TECHNOLOGY DESIGN/BUILD CLUSTER

Endorsed for Illinois
by the
Illinois Occupational Skill Standards
and Credentialing Council

A MESSAGE FROM THE ILLINOIS OCCUPATIONAL SKILL STANDARDS AND CREDENTIALING COUNCIL

Preparing youth and adults to enter the workforce and to be able to contribute to society throughout their lives is critical to the economy of Illinois. Public and private interest in establishing national and state systems of industry-driven skill standards and credentials is growing in the United States, especially for occupations that require less than a four-year college degree. This interest stems from the understanding that the United States will increasingly compete internationally and the need to increase the skills and productivity of the front-line workforce. The major purpose of skill standards is to promote education and training investment and ensure that this education and training enables students and workers to meet industry standards that are benchmarked to our major international competitors.

The Illinois Occupational Skill Standards and Credentialing Council (IOSSCC) has been working with industry subcouncils, the Illinois State Board of Education and other partnering agencies to adopt, adapt and/or develop skill standards for high-demand occupations. Skill standards products are being developed for a myriad of industries, occupational clusters and occupations. This document represents the collaborative effort of the Communications Subcouncil, and the Information Technology Design/Build Cluster Standards Development Committee.

These skill standards will serve as a guide to workforce preparation program providers in defining content for their programs and to employers to establish the skills and standards necessary for job acquisition. These standards will also serve as a mechanism for communication among education, business, industry and labor.

We encourage you to review these standards and share your comments. This effort has involved a great many people from business, industry and labor. Comments regarding their usefulness in curriculum and assessment design, as well as your needs for in-service and technical assistance in their implementation are critical to our efforts to move forward and improve the documents.

Questions concerning this document may be directed to:

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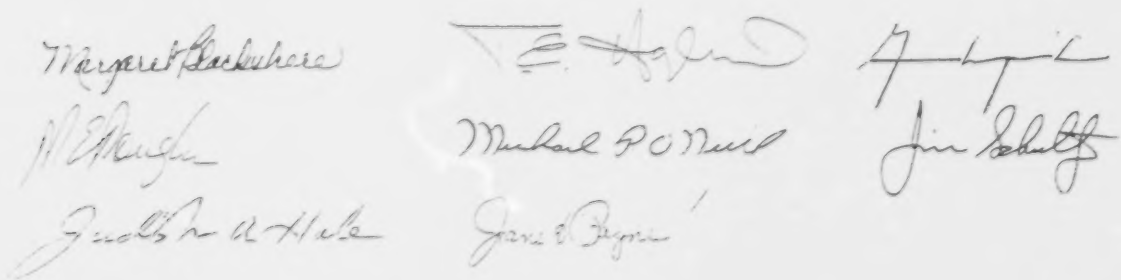
We look forward to your comments.

Sincerely,

The Members of the IOSSCC



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THE ILLINOIS PERSPECTIVE

The Occupational Skill Standards Act (PA 87-1210) established the nine-member Illinois Occupational Skill Standards and Credentialing Council (IOSSCC). Members of the IOSSCC represent business, industry and labor and are appointed by the Governor or State Superintendent of Education. The IOSSCC, working with the Illinois State Board of Education, Illinois Community College Board, Illinois Board of Higher Education, Illinois Department of Employment Security and Illinois Department of Commerce and Community Affairs, has created a common vision for workforce development in Illinois.

VISION

It is the vision of the IOSSCC to add value to Illinois' education and workforce development system by developing and supporting the implementation of a statewide system of industry defined and recognized skill standards and credentials for all major skilled occupations that provide strong employment and earnings opportunities.

The IOSSCC endorses occupational skill standards and credentialing systems for occupations that

- require basic workplace skills and technical training,
- provide a large number of jobs with either moderate or high earnings, and
- provide career advancement opportunities to related occupations with moderate or high earnings.

Subcouncils and Standards Development Committees

Under the direction of the IOSSCC, and in cooperation with industry organizations and associations, industry subcouncils have been formed to review, approve and promote occupational skill standards and credentialing systems. The industry subcouncils are: Agriculture and Natural Resources; Applied Science and Engineering;* Business and Administrative Information Services; Communications; Construction;* Education and Training Services;* Energy and Utilities;* Financial Services; Health and Social Services; Hospitality; Legal and Protective Services;* Manufacturing; Marketing and Retail Trade; and Transportation, Distribution and Logistics. (*Indicates subcouncils identified for future development.)

Standards development committees are composed of business, labor and education representatives who are experts in the related occupational cluster. They work with the product developer to

- develop or validate occupational skill standards,
- identify related academic skills,
- develop or review assessment or credentialing approaches, and
- recommend endorsement of the standards and credentialing system to the industry subcouncil.

Expected Benefits

The intent of skill standards and credentialing systems is to promote investment in education and training and ensure that students and workers are trained to meet industry standards that are benchmarked to the state's major international competitors. Skill standards and credentialing systems have major benefits that impact students and workers, employers and educators in Illinois.

Student and Worker Benefits

- Help workers make better decisions about the training they need to advance their careers
- Allow workers to communicate more effectively to employers what they know and can do
- Improve long-term employability by helping workers move more easily among work roles
- Enable workers to help their children make effective academic and career and technical decisions

Employer Benefits

- Focus the investment in training and reduce training costs
- Boost quality and productivity and create a more flexible workforce
- Improve employee retention
- Improve supplier performance
- Enlarge the pool of skilled workers

Educator Benefits

- Keep abreast of a rapidly changing workplace
- Contribute to curriculum and program development
- Provide students with better career advice
- Strengthen the relationship between schools and local businesses
- Communicate with parents because educators have up-to-date information about industry needs

The IOSSCC is currently working with the Illinois State Board of Education and other state agencies to integrate the occupational standards with the Illinois Learning Standards which describe what students should know and be able to do as a result of their education. The IOSSCC is also working to integrate workplace skills—problem solving, critical thinking, teamwork, etc.—with both the Illinois Learning Standards and the Illinois Occupational Skill Standards.

IOSSCC Requirements for Occupational Skill Standards

Illinois Occupational Skill Standards define what an individual should know and the expected level of performance required in an occupational setting. The standards focus on the most critical work performances for an occupation or occupational area.

Endorsed Occupations

Any occupational skill standards and credentialing system seeking IOSSCC endorsement must

- represent an occupation or occupational cluster that meets the criteria for IOSSCC endorsement, including economic development, earnings potential and job outlook;
- address both content and performance standards for critical work functions and activities for an occupation or occupational area;
- ensure formal validation and endorsement by a representative group of employers and workers within an industry;
- provide for review, modification and revalidation by an industry group a minimum of once every five years;
- award credentials based on assessment approaches that are supported and endorsed by the industry and consistent with nationally recognized guidelines for validity and reliability;
- provide widespread access and information to the general public in Illinois; and
- include marketing and promotion by the industry in cooperation with the partner state agencies.

Recognized Occupations

Occupations that do not meet the earnings criteria for IOSSCC endorsement but are part of an occupational cluster that is being developed may be presented for recognition by the IOSSCC. IOSSCC members encourage individuals to pursue occupational opportunities identified as endorsed occupations. Examples of occupations that do not meet the endorsement criteria, but have been recognized by the IOSSCC are Certified Nurse Assistant and Physical Therapy Aide.

Skill Standards Components

Illinois Occupational Skill Standards must contain the following components:

- Performance Area
- Performance Skill
- Skill Standard
- Performance Elements
- Performance Assessment Criteria

The IOSSCC further identified three components (*Conditions of Performance, Work to be Performed and Performance Criteria*) of the Skill Standard component as critical work functions for an occupation or industry/occupational area. The sample format for Illinois Occupational Skill Standards on the following page provides a description of each component of an occupational skill standard.

The sample format also illustrates the coding at the top of each page identifying the state, fiscal year in which standards were endorsed, Subcouncil abbreviation, cluster abbreviation and standard number. For example, the twenty-fifth skill standard in the Information Technology Design/Build Cluster, which has been developed by the Communications Subcouncil, would carry the following coding: IL.02.COMM.IT/DE-BU.25.

SUMMARY OF WORK TO BE PERFORMED. SUMMARY IS BRIEF AND BEGINS WITH AN ACTION VERB.

IL.FY.SUBCOUNCIL. CLUSTER. STANDARD NO.

PERFORMANCE AREA

SKILL STANDARD

CONDITIONS OF PERFORMANCE

A comprehensive listing of the information, tools, equipment and other resources provided to the person(s) performing the work.

WORK TO BE PERFORMED

An overview of the work to be performed in demonstrating the performance skill standard. This overview should address the major components of the performance. The detailed elements or steps of the performance are listed under "Performance Elements."

PERFORMANCE CRITERIA

The assessment criteria used to evaluate whether the performance meets the standard. Performance criteria specify product/outcome characteristics (e.g., accuracy levels, appearance, results, etc.) and process or procedure requirements (e.g., safety requirements, time requirements, etc.).

PERFORMANCE ELEMENTS

Description of the major elements or steps of the overall performance and any special assessment criteria associated with each element.

PERFORMANCE ASSESSMENT CRITERIA

Listing of required testing, certification and/or licensing.

Product and process used to evaluate the performance of the standard.

PRODUCT

Description of the product resulting from the performance of the skill standard.

PROCESS

Listing of steps from the Performance Elements which must be performed or the required order or performance for meeting the standard.

OCCUPATIONAL EARNINGS AND EMPLOYMENT INFORMATION FOR INFORMATION TECHNOLOGY DESIGN/BUILD CLUSTER

I. Developmental Process and Occupational Definition

A. Developmental Process

After reviewing the current labor market information, the Communications Subcouncil recommended the development of skill standards for Information Technology. The Subcouncil evaluated initial occupational project work and determined that two separate projects should be completed: one for "Operate" and one for "Design/Build". The identified occupations meet the criteria established by the Illinois Occupational Skill Standards and Credentialing Council (IOSSCC) for performance skill standard development, including education and training requirements, employment and earnings opportunities. A product developer knowledgeable about Information Technology began the process of performance skill identification. The product developer prepared an outline and framework designed to address the major skills expected in the workplace. The framework addresses skill requirements common to the creation and installation of systems hardware and software.

The subcouncil recommended that the final skill standards product be presented to the IOSSCC. The IOSSCC reviewed the skill standards and met with the product developer, state liaison and chair of the subcouncil. Based on the review, the IOSSCC voted to endorse the occupations within the Information Technology Cluster Skill Standards.

1. Resources

Resources used include job descriptions from the *Dictionary of Occupational Titles; Bureau of Labor Statistics Standard Occupational Classification;* acinet.org; CareerJournal.com; the ABI database; and Salary.com.

2. Standards Development Committee

The Standards Development Committee was composed of workers from all levels within the Information Technology Cluster. The framework and initial outline of performance skills were addressed and reviewed at an initial meeting. During this time the work titles and skill matrix were accepted and the skills standards were reviewed and revisions suggested. Additional meetings took place and the skills standards, occupational titles and matrix were reviewed and then accepted by the Standards Development Committee. The Communications Subcouncil reviewed and approved the cluster.

B. Occupational Definition

Information technology (IT) workers are not unique to software and high technology firms; they are as common in the general workplace as in technology-based organizations. The following definition is taken from John Viulami's book, *The World of Information Technology*: "IT encompasses all the technologies used for creating, abstracting, visualizing, presenting, collaborating, communicating, and otherwise 'managing' the flow of information." IT workers are needed for knowledge-based work in all areas of work in companies and organizations involved in every kind of product and service. IT workers are involved in careers such as manufacturing, sales, customer service, and product development and are found in organizations ranging from high-tech industries, such as software development and biotechnology, to service industries, such as banking and insurance.

1. **Technical Writer**

   Prepares and/or maintains documentation pertaining to programming, systems operation and user documentation. Translates business specifications into user documentation. Plans, writes and maintains systems and user support documentation efforts, including online help screen. May require an associate's degree in a related area and 0-2 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and preestablished guidelines to perform the functions of the job. Works under immediate supervision and typically reports to a supervisor or manager.

2. **Programmer**

   Reviews, analyzes and modifies programming systems including encoding, testing, debugging and documenting programs. May require an associate's degree in a related area and 0-3 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and preestablished guidelines to perform the functions of the job. Works under immediate supervision. Typically reports to a project leader or manager.

3. **Systems Analyst**

   Reviews, analyzes and modifies programming systems including encoding, testing, debugging and installing to support an organization's application systems. Consults with users to identify current operating procedures and to clarify program objectives. May require a bachelor's degree in a related area and 0-2 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and preestablished guidelines to perform the functions of the job. Works under immediate supervision and typically reports to a project leader or manager.

4. **Network Architect**

   Reviews, plans and evaluates network systems. May troubleshoot network systems and recommend improvements to network. Provides documentation/project tracking and management reporting. Provides tactical and strategic input on overall network planning and related projects. May require a bachelor's degree in a related area and 0-2 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and preestablished guidelines to perform the functions of the job. Works under immediate supervision and typically reports to a project leader or manager.

5. **Application/Product Architect**

   Designs, modifies, develops, writes and implements software programming applications. Supports and/or installs software applications. Participates in the testing process through test review and analysis, test witnessing and certification of software. May require a bachelor's degree in a related area and 0-2 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and preestablished guidelines to perform the functions of the job. Works under immediate supervision and typically reports to a manager.

6. **Network Engineer**

Reviews, plans and evaluates network systems. May troubleshoot network systems and recommend improvements to network. Provides documentation/project tracking and management reporting. Provides tactical and strategic input on overall network planning and related projects. May require a bachelor's degree in a related area and 0-3 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and preestablished guidelines to perform the functions of the job. Works under immediate supervision. Typically reports to a project leader or manager.

7. **Database Administrator**

Administers, maintains, develops and implements policies and procedures for ensuring the security and integrity of the company database. Implements data models and database designs, data access and table maintenance codes, resolves database performance issues, database capacity issues, replication, and other distributed data issues. May require a bachelor's degree in a related area and/or 2-4 years of experience in the field or in a related area. Must be familiar with standard concepts, practices and procedures within a particular field. Relies on limited experience and judgment to plan and accomplish goals. Performs a variety of tasks. Works under general supervision and typically reports to a manager. A certain degree of creativity and latitude is required.

I1. Developmental Process and Occupational Definition

A. Education and Training Requirements

Computer maintenance/technical support technician, help desk support, and application/computer support specialist personnel require two years or less of post-secondary education, apprenticeship, specialized training or equivalent work experience. Network administrator, systems administrator, database administrator, and systems operator personnel require at least two years of postsecondary education, apprenticeship, specialized training or equivalent work experience.

B. Employment Opportunities

In Illinois, overall employment of information technology workers is expected to grow faster than average through the year 2008. Many information technology occupations are listed on the 50 fastest growing occupations in the state and should provide ample employment opportunities in the future.

C. Earnings Opportunities

	Middle Range Annual Earnings, 2000*	
Technical Writer	$30,839-35,134	[1]
Programmer	$38,399-48,802	[1]
Systems Analyst	$41,441-55,152	[1]
Network Architect	$44,166-64,863	[2]
Application/Product Architect	$47,330-57,640	[2]
Network Engineer	$48,926-53,723	[2]
Database Administrator	$59,759-87668	[1]

** Middle range is the middle 50%, i.e., one-fourth of persons in the occupation earn below the bottom of the range and one-fourth of persons in the occupation earn above the top of the range.*

Sources: [1] *Occupational Employment Statistics: Wage Data*, Illinois Department of Employment Security, Economic Information and Analysis Division. [2] Salary.com, these numbers are based on the national average adjusted by geographic salary differentials to Bloomington, Illinois as of July 22, 2001.

III. Assessment and Credentialing Systems

The IOSSCC recognizes that industry commitment for third-party assessment is beneficial and requests that each Standards Development Committee (SDC) and/or Subcouncil identifies the most beneficial method for assessing standards.

Several existing industry credentials are compatible with the Illinois Occupational Skill Standards. As a core, achievement of the Illinois skills standards is preparation for those credentials that require work experience, professional development and/or course work. Advanced credentials are available through a variety of software and/or hardware vendors (e.g., IBM, Microsoft, Cisco, Novell, A+, etc.). The information technology worker should choose the credentialing agency most appropriate to the employer's needs in a particular position.

IV. Industry Support and Commitment

A. Industry Commitment for Development and Updating

1. The Communications Subcouncil and the Information Technology Design/Build Cluster Standards Development Committee developed these performance skill standards. The development effort utilized the following steps:
   a. Identification of performance skills
   b. Review of resources
   c. Development of draft performance skills
   d. Convening of standards development committee
   e. Validation and approval of performance skills by standards development committee
   f. Review of skill standards by standards development committee
   g. Review and approval of the skill standards by the Communications Subcouncil and practitioners
   h. Endorsement of skill standards by IOSSCC
2. A list of members of the Communications Subcouncil and Information Technology Cluster Standards Development Committee are located in Appendix.

B. Industry Commitment for Marketing

The Communications Subcouncil is committed to marketing and obtaining support and endorsement from the leading industry associations impacted by the skill standards. Upon recognition/endorsement of the Information Technology Cluster skill standards by the IOSSCC, the subcouncil strongly recommends developing and providing an in-service/seminar package for its members to provide awareness and obtain full industry commitment to the development of a full industry marketing plan.

The Communications Subcouncil encourages the availability of occupational skill standards to the public, including students, parents, workers, educators at all levels, employers and industry organizations personnel.

ASSUMPTIONS FOR INFORMATION TECHNOLODY OPERATE CLUSTER SKILL STANDARDS

Skill standards assume that individuals have received education and/or training in a setting such as a secondary, postsecondary and/or apprenticeship/on-the-job training program and have the background knowledge necessary for performing the skill standards contained in this publication. The education and/or training includes instruction for the proper handling and operation of materials, tools and equipment required for performing the skills including the purpose of use, when to use, how to use and any related safety issues.

The instructional/training program must adhere to all local, state and federal licensing and/or certification requirements as set by law, if applicable.

The Standards Development Committee developed these skill standards based on the following assumptions:

1. Workplace skills (employability skills) are expected of all individuals. Socialization skills needed for work are related to lifelong career experience and are not solely a part of the initial schooling process. These are not included with this set of statements.
2. The ability to work with numbers and to communicate clearly, concisely and legibly to team members and management are expected of all individuals.
3. Specific policies and procedures of the worksite will be made known to the individual and will be followed.
4. Time elements outlined for the skill standards result from the experience and consideration of the panel of experts who made up the standards development committee.
5. Skills will progress from simple to complex. Once a skill has been successfully performed, it will be incorporated into more complex skills.
6. Skill standards describe the skill only and do not detail the background knowledge or theory related to the particular skill base. Although the skill standard enumerates steps to successful demonstration, rote approaches to the outcomes are not prescribed.
7. Skill standards do not replace, supersede or substitute for procedures manuals.

PERFORMANCE SKILL LEVELS

	Technical Writer	Programmer	System Analyst	Network Architect	Application Protuct Architect	Network Engineer	Database Administrator
ANALYSIS							
Identify Customer's Requirements	•	•	•	•	•	•	•
Evaluate Equipment Requirements	•	•	•	•	•	•	•
Define Scope of Work	•	•	•	•	•	•	•
Develop Contingency Plans						•	
Model Business Processes						•	
Evaluate Present Data and System Configuration						•	
Address Customer Concerns/Complaints						•	
Analyze Job Status						•	
Identify Job Constraints	•	•	•	•	•		•
Evaluate Impact of Technical Alternatives			•	•			
Prepare Proof of Concept	•						
Prepare Functional Requirements	•						
Create Preliminary Design	•						
Perform Market Research	•						
Analyze System Interdependencies	•						
Perform Cost/Benefit Analysis	•						
Secure Decision to Make or Buy Components	•						
Evaluate Outsource Alternatives	•						
Develop Job Plan			•				
Analyze Facility Bandwidth Requirements and Capacity Planning			•				
Develop Test Strategies		•			•		•
SYSTEM DESIGN							
Develop Detailed Design Document		•			•		•
Establish Data Elements		•			•		•
Identify Maintenance Requirements		•			•		•
Perform Feasibility Studies of Design Alternatives		•			•		•
Identify Physical Requirements for System Implementation		•			•		•
Conduct Design Review		•			•		•
Identify Usability Factors		•			•		•
Determine Security Requirements		•			•		•
Develop Prototype Design of System		•			•		•

PERFORMANCE SKILL LEVELS *(Continued)*

	Technical Writer	Programmer	System Analyst	Network Architect	Application Product Architect	Network Engineer	Database Administrator
VISUAL DESIGN							
Create Look and Feel of Product	•						
Complete Basic Design	•						
Create Two Dimensional Representation of 3-D Shapes and Textures	•						
Integrate Human Factors and User Interface for Visual Design	•						
Produce Simulations	•						
FUNCTIONAL DESIGN							
Prepare Functional Specifications	•						
Select Media Types	•						
Determine Delivery Platform(s)	•						
Create Final System Architecture Design	•						
Complete User Interface Design	•						
Document Navigation Schema	•						
MULTIMEDIA PRODUCTION AND ACQUISITION							
Identify Available Multimedia Content Sources	•						
Identify Timeline Constraints and Project Interdependencies	•						
Create Textual Content	•						
Produce or Acquire Graphics Content	•						
Produce or Acquire Animation Content	•						
Produce or Acquire Audio Content	•						
Produce or Acquire Video Content	•						
Produce or Acquire Simulations or Virtual Environments	•						
DEVELOPMENT							
Organize Components	•	•					
Incorporate Functional Design Criteria	•	•					
Incorporate Human Factors Into Functional Design	•	•					
Acquire Development Tools	•	•					
Develop Product Components	•	•					
Create and/or Modify System Interfaces		•			•		•

PERFORMANCE SKILL LEVELS *(Continued)*

	Technical Writer	Programmer	System Analyst	Network Architect	Application Product Architect	Network Engineer	Database Administrator
TESTING							
Develop Test Plan	•		•				
Identify Test Plan Resources			•				
Administer Product Testing			•				
Analyze Results of Test		•					
Resolve Identified Problems		•					
Assess Impact of Product on Current System		•					
IMPLEMENTATION							
Develop Production Plan		•			•		•
Schedule Production Training		•			•		•
Conduct Production Training		•			•		•
Evaluate Production Training		•			•		•
Execute Production Implementation Plan		•			•		•
Evaluate Production Implementation Results		•			•		•
EDUCATION/TRAINING							
Perform Training Needs Assessment	•					•	
Define Learning Objectives	•					•	
Determine Training Delivery Method	•					•	
Develop Learning Assessments	•					•	
Acquire/Develop Training Materials	•					•	
Conduct Training Session	•					•	
Evaluate Effectiveness of Training	•					•	
DOCUMENTATION							
Publish Problem Solutions in Knowledge Base	•					•	
Prepare Customer-Oriented Solution Summary	•					•	
PROJECT MANAGEMENT							
Define Scope of Project	•		•	•	•	•	
Identify Stakeholders, Decision-Makers and Escalation Procedures	•		•	•	•	•	
Develop Task List	•		•	•	•	•	
Identify Required Resources	•		•	•	•	•	
Estimate Time Requirements	•	•	•	•	•	•	•
Schedule Change	•		•	•	•	•	
Perform Capacity and Resource Planning	•		•	•	•	•	
Track Critical Milestones	•		•	•	•	•	
Secure Required Resources	•		•	•	•	•	
Manage Change Control Process	•	•	•	•	•	•	•
Report Project Status	•		•	•	•	•	

IDENTIFY CUSTOMER'S REQUIREMENTS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Job request form
- Technical manuals
- Customer interviews (internal/external)
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Identify customer's requirements.

PERFORMANCE CRITERIA

Customer's requirements are identified according to company policy and procedures.

System information is accurate and complete.

Time to complete the skill varies with the complexity of existing and proposed systems.

PERFORMANCE ELEMENTS

1. Review job request form.
2. Analyze responses from interviews.
3. Identify additional information required.
4. Collect and document additional information.
5. Document customer requirements.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Customer's requirements are documented.

PROCESS

All performance elements for analyzing and identifying customer's requirements are critical. The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

EVALUATE EQUIPMENT REQUIREMENTS.

ANALYSIS

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Customer requirements
- System requirements
- Physical requirements
- Proposed changes
- Hardware, software and operating systems
- Commercial computing products knowledge
- Company policy and procedures

WORK TO BE PERFORMED

Evaluate equipment requirements and present for customer approval.

PERFORMANCE CRITERIA

Equipment requirements are documented and presented for customer approval.

Time to complete the skill varies with the complexity of customer and system requirements.

PERFORMANCE ELEMENTS

1. Review current system platforms.
2. Review customer and system/physical requirements.
3. Review desired results/outcomes.
4. Identify additional equipment requirements.
5. Present additional equipment requirements for customer approval.
6. Document and distribute to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Equipment requirements are evaluated and presented for approval.

PROCESS

All performance elements for evaluating equipment requirements are critical. The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

DEFINE SCOPE OF WORK.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Approved equipment requirements
Hardware, software and operating systems
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Define scope of work to meet customer equipment requirements.

PERFORMANCE CRITERIA

Estimate of time, materials and capabilities needed to meet customer requirements is prepared according to company policy and procedures.

Size and specifics of work involved are identified accurately.

Time to complete the skill varies with the complexity of existing and proposed requirements.

PERFORMANCE ELEMENTS

1. Identify equipment acquisition options (e.g., buy, build, lease, etc.).
2. Identify steps to acquire equipment.
3. Identify timeline to meet equipment requirements.
4. Predict outcomes/results.
5. Document recommended option(s).
6. Create schedule chart(s).
7. Complete supporting documents.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Scope of work is defined based on resource availability and customer requirements.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill. Performance elements two through five are repeated for each acquisition option.

DEVELOP CONTINGENCY PLANS.

ANALYSIS

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Key sources of information
- Scope of work
- Risk analysis techniques and scenarios
- Technology constraints
- Constraints of various computing applications
- Office application software tools
- Network and online resources
- Multiple operating systems
- Company policy and procedures

WORK TO BE PERFORMED

Develop contingency plans.

PERFORMANCE CRITERIA

Contingency plans are developed for risk and tradeoff analysis according to company policy and procedures.

Time to complete the skill varies with the complexity of scope of work.

PERFORMANCE ELEMENTS

1. Review scope of work.
2. Identify risks.
3. Predict outcome/results.
4. Analyze risks and tradeoffs.
5. Prepare contingency plans.
6. Document and distribute contingency plans to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Contingency plan is developed.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

MODEL BUSINESS PROCESSES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Client's business processes (e.g., inputs, outputs, data flow diagrams, storage, etc.)
- Hardware, software and operating systems
- Modeling techniques and tools
- Company policy and procedures

WORK TO BE PERFORMED

Model business processes.

PERFORMANCE CRITERIA

Business processes are modeled, documented and communicated according to company policy and procedures.

PERFORMANCE ELEMENTS

1. Identify business processes that are impacted by design.
2. Analyze appropriate processes.
3. Model processes.
4. Document and distribute modeling results to client.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Business processes are modeled, documented and communicated to client.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

EVALUATE PRESENT DATA AND SYSTEM CONFIGURATION.

ANALYSIS

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- System components
- Scope of work
- Standard system configurations
- Hardware, software and operating systems
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Evaluate present data and system configuration.

PERFORMANCE CRITERIA

Present data and system configuration information is documented according to company policy and procedures.

Time to complete the skill varies with the complexity of system configuration.

PERFORMANCE ELEMENTS

1. Review system requirements and configuration.
2. Identify desired results.
3. Compare required/revised configuration to current configuration.
4. Document differences.
5. Distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

System configuration description is completed.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

ADDRESS CUSTOMER CONCERNS/COMPLAINTS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

List of customer concerns/complaints
Scope of work
System and physical requirements
Hardware, software and operating systems
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Prepare action plan to address customer concerns/complaints.

PERFORMANCE CRITERIA

Plan of action to address customer concerns is developed according to scope of work and company policy and procedures.

Time to complete the skill varies with the complexity of customer concerns.

PERFORMANCE ELEMENTS

1. Review scope of work.
2. Confirm customer concerns/complaints.
3. Identify possible solutions and tradeoffs.
4. Develop plan of action.
5. Document and distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Plan of action to address customer concerns is developed.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

ANALYSE JOB STATUS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Project documentation
- Project tracking system
- Scope of work
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Analyze job status.

PERFORMANCE CRITERIA

Job status is communicated to designated parties according to company policy and procedures.

The status is updated/completed within the time specified on project timeline.

PERFORMANCE ELEMENTS

1. Review project documentation.
2. Collect project information.
3. Create supporting documentation.
4. Update job status documentation.
5. Present/communicate job status at appropriate audience level.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Job status is communicated to the appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

IDENTIFY JOB CONSTRAINTS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Sources of information
- Risk analysis techniques and scenarios
- Personnel
- Budget
- Scope of work
- Time availability/requirements
- System and application compatibility issues
- Physical requirements
- Technology requirements
- Customer requirements
- Company policy and procedures

WORK TO BE PERFORMED

Identify job constraints.

PERFORMANCE CRITERIA

Job constraints are identified and documented according to company policy and procedures.

Time to complete the skill varies with the complexity of scope of work.

PERFORMANCE ELEMENTS

1. Review scope of work.
2. Identify required resources.
3. Compare available resources to required resources.
4. Identify job constraints.
5. Document and distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Job constraints are identified.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

EVALUATE IMPACT OF TECHNICAL ALTERNATIVES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

System performance
Impact on current system
Current technology
Information for available and projected technology
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Evaluate impact of technical alternatives.

PERFORMANCE CRITERIA

Impact of technical alternatives is evaluated and communicated according to company policy and procedures.

Time to complete the skill varies with the complexity of existing and proposed alternatives.

PERFORMANCE ELEMENTS

1. Review current and projected technologies.
2. Review impact of current system.
3. Identify alternatives.
4. Evaluate effectiveness of alternatives.
5. Identify risks and dependencies.
6. Document impact of alternatives.
7. Distribute recommendations to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Impact of technical alternatives is evaluated and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

PREPARE PROOF OF CONCEPT.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Proof of concept design tools and procedures
Simulation and testing procedures for feasibility models
Constraints
Scope of work
Company policy and procedures

WORK TO BE PERFORMED

Prepare proof of concept.

PERFORMANCE CRITERIA

Proof of concept is completed according to customer requirements and scope of work.

Time to complete the skill varies with the complexity of customer requirements and scope of work.

PERFORMANCE ELEMENTS

1. Review scope of work.
2. Create/develop new concepts.
3. Compare concepts to customer requirements.
4. Review concepts with team members.
5. Communicate and negotiate with customer.
6. Document customer decision on proof of concept.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Proof of concept is completed and presented to customer.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used. Steps two through five are repeated as needed.

PREPARE FUNCTIONAL REQUIREMENTS.

ANALYSIS

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Modeling software
- Proof of concept
- Overall project requirements
- Company policy and procedures

WORK TO BE PERFORMED

Prepare functional requirements of proof of concept.

PERFORMANCE CRITERIA

Functional requirements are prepared and documented according to company policy and procedures.

Time to complete the skill varies with the complexity of proof of concept and project requirements.

PERFORMANCE ELEMENTS

1. Review proof of concept and project requirements.
2. Identify functional requirements.
3. Document functional requirements.
4. Distribute recommendations to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Functional requirements are completed and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

CREATE PRELIMINARY DESIGN.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Design tools and procedures
- Functional specifications
- Scope of work
- Resource constraints
- Proof of concept
- Company policy and procedures

WORK TO BE PERFORMED

Create preliminary design.

PERFORMANCE CRITERIA

Preliminary design is completed according to functional specifications, scope of work and resources.

Time to complete the skill varies with the complexity of functional specifications and scope of work.

PERFORMANCE ELEMENTS

1. Review functional specifications.
2. Identify additional details for functional elements (e.g., input, process, output, dependencies, connectivity, etc.).
3. Document additional details.
4. Develop preliminary design.
5. Review preliminary design with team members.
6. Communicate preliminary design to customer.
7. Document customer decision on preliminary design.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Preliminary design is presented to relevant team members and the customer.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

PERFORM MARKET RESEARCH.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Current technology
Proposed requirements
Multimedia publications
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Perform market research.

PERFORMANCE CRITERIA

Market analysis is completed and distributed according to company policy and procedures.

Time to complete the skill varies with the complexity of existing and proposed requirements.

PERFORMANCE ELEMENTS

1. Review proposed technology.
2. Identify existing products with similar characteristics.
3. Complete comparative analysis of similar products.
4. Document and distribute analysis to appropriate team members.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Market analysis is completed and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

ANALYZE SYSTEM INTERDEPENDENCIES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Current technology
Planned technology
Proposed technology
Product integration principles
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Analyze system interdependencies.

PERFORMANCE CRITERIA

Potential system conflicts are identified and documented according to company policy and procedures.

Time to complete the skill varies with the complexity of current, planned and proposed technology.

PERFORMANCE ELEMENTS

1. Create list of products.
2. Identify points of interface.
3. Identify product and interface constraints.
4. Identify issues between proposed technology and current/planned technology.
5. Document potential points of conflict.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Potential system conflicts are identified and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

PERFORM COST/BENEFIT ANALYSIS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Current technology
- Specifications/cost information
- Risk analysis results
- Cost benefit analysis tools and procedures
- Scope of work
- Budget constraints
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Perform cost/benefit analysis.

PERFORMANCE CRITERIA

Cost/benefit analysis report is documented and communicated to appropriate parties according to cost benefit analysis procedures.

Analysis report is understandable by a nontechnical person.

Time to complete the skill varies with the complexity of specifications/cost information and scope of work.

PERFORMANCE ELEMENTS

1. Identify cost components.
2. Identify benefits (e.g., cost, quality, time, life cycle, etc.).
3. Compare risks, benefits and costs to desired outcome.
4. Document analysis results.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Cost/benefit analysis is completed and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

SECURE DECISION TO MAKE OR BUY COMPONENTS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Cost/benefit analysis
- Scope of work
- Project constraints
- Budget
- Information about available and projected technology
- Vendor information
- Technical alternatives
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Secure decision to make or buy components.

PERFORMANCE CRITERIA

Decisions made are congruent with project goal, scope and budget.

Time to complete the skill varies with the complexity of scope of work.

PERFORMANCE ELEMENTS

1. Review technical alternatives.
2. Review decision-making parameters.
3. Review cost/benefit analysis.
4. Document options.
5. Prioritize options.
6. Recommend options to appropriate parties.
7. Secure decision from appropriate parties.
8. Document and distribute recommendations to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Decision to make or buy components is secured.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

EVALUATE OUTSOURCE ALTERNATIVES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

List of vendors
Product specifications
Scope of work
Outsource requirements (including components for "make" decision and products for "buy" decision)
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Evaluate outsource alternatives.

PERFORMANCE CRITERIA

Outsource proposal process is completed according to company policy and procedures.

Time to complete the skill varies with the complexity of existing and proposed requirements.

PERFORMANCE ELEMENTS

1. Review product specifications.
2. Compare outsource requirements to available products in order to identify eligible vendors.
3. Prepare proposal of outsource requirements/product specifications and scope of work for vendors.
4. Solicit requests for outsource proposals.
5. Review outsource proposals.
6. Make recommendation for outsource vendor.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Requests for proposals are sent to vendors and a recommendation is made.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

DEVELOP JOB PLAN.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Established installation processes
System development life cycle (SDLC)
Scope of work
Current technology
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Develop job plan.

PERFORMANCE CRITERIA

Job plan is completed according to company policy and procedures.

Time to complete the skill varies with the complexity of scope of work.

PERFORMANCE ELEMENTS

1. Review scope of work.
2. Review SDLC.
3. Integrate scope of work into SDLC.
4. Complete job plan.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Job plan is completed.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

ANALYZE FACILITY BANDWIDTH REQUIRMENTS AND CAPACITY PLANNING.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- System requirements
- Current and planned technology
- Traffic analysis tools
- System/network analysis procedures
- Hardware components
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Analyze facility bandwidth requirements and capacity planning.

PERFORMANCE CRITERIA

Facility bandwidth requirements are analyzed according to company policy and procedures.

System constraints are identified with 100% accuracy.

Time to complete the skill varies with the complexity of bandwidth requirements and current/planned technology.

PERFORMANCE ELEMENTS

1. Perform system/network analysis.
2. Compare system/network analysis to system requirements.
3. Analyze system/network for growth potential.
4. Identify constraints.
5. Document recommendation for upgrade.
6. Distribute results to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Facility bandwidth requirements are documented and upgrades recommended to appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

DEVELOP TEST STRATEGIES.

ANALYSIS

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Testing tools
- System development life cycle (SDLC)
- Job plan
- Project constraints
- Scope of work
- System specifications
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Develop test strategies.

PERFORMANCE CRITERIA

Testing strategy is developed according to job plan.

Time to complete the skill varies with the complexity of planned methodologies.

PERFORMANCE ELEMENTS

1. Identify testing schedule using job plan.
2. Define appropriate testing methodologies.
3. Identify resources available.
4. Document test strategy.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Testing strategy is selected and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

DEVELOP DETAILED DESIGN DOCUMENT.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Job plan
- Preliminary design
- Technical analyses report
- Business analyses report
- Principles of design and development
- Current technology
- Planned technology
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Develop detailed design document.

PERFORMANCE CRITERIA

Detailed design is completed according to preliminary design and analyses.

Time to complete the skill varies with the complexity of client requirements.

PERFORMANCE ELEMENTS

1. Review preliminary design.
2. Incorporate changes based on analyses into design.
3. Document additional details.
4. Develop detailed design.
5. Review detailed design with team members.
6. Communicate detailed design to customer.
7. Document customer decision on detailed design.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Detailed design is documented and presented to customer.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

ESTABLISH DATA ELEMENTS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Detailed design document
- Normalization and relational theory
- Data dictionary
- Data modeling tools
- Company policy and procedures

WORK TO BE PERFORMED

Establish data elements.

PERFORMANCE CRITERIA

Data elements are established to meet the needs outlined in detailed design document.

Time to complete the skill varies with the complexity of data model.

PERFORMANCE ELEMENTS

1. Review detailed design document.
2. Define data elements.
3. Develop entity relationships.
4. Normalize data.
5. Document and distribute data model to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Data elements are established and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

IDENTIFY MAINTENANCE REQUIREMENTS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Architectural principles of programming
List of maintenance enhancements
System configurations
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Identify maintenance requirements.

PERFORMANCE CRITERIA

Potential maintenance enhancements are identified.

Time to complete the skill varies with the complexity of existing and proposed requirements.

PERFORMANCE ELEMENTS

1. Review detail design and scope of work.
2. Evaluate proposed technology.
3. Review network and online resources for updates.
4. Propose maintenance schedule.
5. Identify maintenance tools and resources.
6. Document maintenance schedule.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Maintenance resource needs are determined and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

PERFORM FEASIBILITY STUDIES OF DESIGN ALTERNATIVES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

General and detail design specifications
Design limitations and tradeoffs
Potential impact on whole system
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Perform feasibility studies of design alternatives.

PERFORMANCE CRITERIA

Design alternatives are identified and documented according to company policy and procedures.

Time to complete the skill varies with the complexity of design specifications

PERFORMANCE ELEMENTS

1. Identify design alternatives.
2. Analyze design alternatives.
3. Evaluate effectiveness of design alternatives.
4. Document design alternatives.
5. Distribute recommendations to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Design alternatives are identified, documented and communicated to appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

IDENTIFY PHYSICAL REQUIREMENTS FOR SYSTEM IMPLEMENTATION.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Technology analyses report
Business analyses report
Detailed design document
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Identify physical requirements for system implementation

PERFORMANCE CRITERIA

Physical requirements are identified and documented according to company policy and procedures.

Time to complete the skill varies with the complexity of detailed design and project plan.

PERFORMANCE ELEMENTS

1. Review detailed design and analyses.
2. Identify physical requirements of proposed system.
3. Document and recommend needed physical requirements.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Physical requirements system implementation are identified and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

CONDUCT DESIGN REVIEW.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Detailed design specifications
- Design review procedures and process
- Current technology
- Hardware components
- Networks and multiple operating systems
- Presentation equipment and software
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Conduct design review.

PERFORMANCE CRITERIA

Design review is completed according to company policy and procedures.

Time to complete the skill varies with the complexity of detailed design specifications.

(Example Design review conference with two alternatives and three participants is completed in one hour.)

PERFORMANCE ELEMENTS

1. Identify key parties.
2. Schedule design review logistics.
3. Prepare and distribute design review materials (e.g., detailed design specifications, current technology, hardware components, networks and multiple operating systems).
4. Conduct design review.
   a. Summarize information.
   b. Facilitate design review.
   c. Document feedback.
   d. Document action items for follow-up.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Design review is completed.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however a different sequence may be used.

IDENTIFY USABILITY FACTORS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Detailed design specifications
User interface design principles
Human factors analysis principles
Industry design standards
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Identify usability factors.

PERFORMANCE CRITERIA

Usability factors are documented according to company policy and procedures.

Time to complete the skill varies with the complexity of existing and proposed requirements.

PERFORMANCE ELEMENTS

1. Profile end user factors and environments.
2. Identify type and frequency of interaction with product.
3. Document usability factors.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Usability factors are identified and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Detailed design specifications
- Scope of work
- List of security risks
- Current technology
- Security policies (customer and company)
- Security tools
- Network protocols
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Determine security requirements.

PERFORMANCE CRITERIA

Security requirements are established according to scope of work, security policies and company policy and procedures.

Time to complete the skill varies with the complexity of existing and proposed requirements.

PERFORMANCE ELEMENTS

1. Review detail design and scope of work.
2. Review security policies.
3. Review security protocols for current technology.
4. Identify product fields, functions and devices requiring security.
5. Identify types and levels of security required for each field, function and device.
6. Resolve security conflicts.
7. Document security requirements.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Security requirements are identified and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

DEVELOP PROTOTYPE DESIGN OF SYSTEM.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Prototype tools
- Detailed design specifications
- Scope of work
- Usability factors
- Job plan
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Develop prototype design of system.

PERFORMANCE CRITERIA

Prototype is developed according to detailed design and is approved by customer.

Time to complete the skill varies with the complexity of scope of work and project plan.

PERFORMANCE ELEMENTS

1. Review detailed design.
2. Select prototype tools.
3. Develop prototype.
4. Evaluate prototype with team members.
5. Evaluate prototype with customer.
6. Make modifications, as needed.
7. Document feedback and modifications.
8. Obtain customer approval.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Prototype is developed, evaluated and meets customer expectations.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

CREATE LOOK AND FEEL OF PRODUCT.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Marketing materials
- Approved prototype
- Usability factors
- Principles of color
- Cultural and contextual use of color
- Hardware and software color specifications
- Multimedia design tools
- Company design standards
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Create look and feel of the product.

PERFORMANCE CRITERIA

Product look and feel is completed according to approved prototype and company policy and procedures.

Time to complete the skill varies with the complexity of approved prototype.

PERFORMANCE ELEMENTS

1. Review marketing materials.
2. Create basic layout.
3. Create basic elements.
4. Evaluate look and feel with team members.
5. Evaluate look and feel with customer.
6. Document feedback.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Product look and feel is created and represents message and image of concept.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

COMPLETE BASIC DESIGN.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Approved prototype
Look and feel feedback document
Multimedia design tools
Company design standards
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Complete basic design.

PERFORMANCE CRITERIA

Basic design is completed according to plan and approved by customer.

Time to complete the skill varies with the complexity of plan specifications.

PERFORMANCE ELEMENTS

1. Review look and feel feedback document.
2. Incorporate changes.
3. Complete basic design.
4. Evaluate basic design with team members.
5. Evaluate basic design with customer.
6. Document feedback.
7. Obtain customer approval.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Basic design is completed and approved by customer.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

CREATE TWO-DIMENSIONAL REPRESENTATION OF 3-D SHAPES AND TEXTURES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Basic design specifications
- Scope of work
- Representative object
- Conceptualized 3-D shapes and textures
- Multimedia design tools
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Create two-dimensional representation of 3-D shapes and textures.

PERFORMANCE CRITERIA

Two-dimensional representations of 3-D shapes and textures are created according to scope of work.

Time to complete the skill varies with the complexity of basic design and scope of work.

PERFORMANCE ELEMENTS

1. Convert object to digital image.
2. Review project plan and/or scope of work.
3. Determine desired representation of 3-D objects.
4. Create two-dimensional representation.
5. Compare two-dimensional representation to scope of work.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Two-dimensional representations of 3-D shapes and textures are created.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

INTEGRATE HUMAN FACTORS AND USER INTERFACE FOR VISUAL DESIGN.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Human factors analysis principles
- Usability factors
- Basic design specifications
- Functional design elements
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Integrate human factors and user interface for visual design.

PERFORMANCE CRITERIA

Human factors are incorporated into visual design.

Time to complete the skill varies with the complexity of basic design and usability factors.

PERFORMANCE ELEMENTS

1. Review usability/human factors.
2. Incorporate visual design features to accommodate usability/human factors.
3. Review visual design with team members.
4. Document changes.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Human factors and user interface are integrated into visual design.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Detailed design specifications
- Scope of work
- Approved prototype
- Usability factors
- Simulation hardware and software
- Multimedia design tools
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Produce design simulations.

PERFORMANCE CRITERIA

Design simulations are produced according to scope of work.

Time to complete the skill varies with the complexity of detailed design and scope of work.

PERFORMANCE ELEMENTS

1. Review detailed design and scope of work.
2. Enter design information into simulation software.
3. Create simulation.
4. Compare simulation to scope of work.
5. Adjust simulation as necessary.
6. Document simulation results.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Simulation is produced and evaluated.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

PREPARE FUNCTIONAL SPECIFICATIONS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Functional requirements
- Basic design specifications
- Scope of work
- Multimedia requirements
- Specification procedures
- Multimedia design tools
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Prepare functional specifications.

PERFORMANCE CRITERIA

Functional specifications are prepared and documented according to company policy and procedures.

Time to complete the skill varies with the complexity of functional requirements.

PERFORMANCE ELEMENTS

1. Review functional requirements and basic design.
2. Identify functional specifications.
3. Create supporting documents.
4. Review with appropriate parties.
5. Incorporate revisions to functional specifications.
6. Distribute specifications to appropriate parties.
7. Obtain approval according to scope of work.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Functional specifications are documented and approved by appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

SELECT MEDIA TYPES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Functional specifications
- Scope of work
- Usability factors
- Business analyses reports
- Media types (CD-ROM, Web based, etc.)
- Multimedia element costs and supporting hardware
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Select media types.

PERFORMANCE CRITERIA

Media types are recommended to appropriate parties and selection made according to company policy and procedures.

Time to complete the skill varies with the complexity of functional specifications and scope of work.

PERFORMANCE ELEMENTS

1. Review functional specifications, business analyses, usability factors and scope of work.
2. Compare media characteristics and costs to scope of work.
3. Provide recommendation and alternatives/tradeoffs to appropriate parties.
4. Document selected media type based on appropriate parties' feedback.
5. Distribute selected media type as required.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Media types are selected.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

DETERMINE DELIVERY PLATFORM(S).

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Existing and proposed requirements
- Selected media type(s)
- Business analyses reports
- Technology analyses reports
- Scope of work
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Determine delivery platform(s).

PERFORMANCE CRITERIA

Delivery platform(s) is identified and documented according to company policy and procedures.

Time to complete the skill varies with the complexity of existing and proposed requirements.

PERFORMANCE ELEMENTS

1. Review platform(s), scope of work and analyses.
2. Identify feasible delivery platform(s).
3. Evaluate feasible delivery platform(s).
4. Provide recommendation and alternatives/tradeoffs to appropriate parties.
5. Document selected delivery platform(s) based on appropriate parties' feedback.
6. Distribute selected delivery platform(s) as required.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Delivery platform(s) is identified and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

CREATE FINAL SYSTEM ARCHITECTURE DESIGN.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- System architecture design specifications
- Functional specifications
- Detailed design specifications
- Scope of work
- Multimedia requirements
- Design procedures
- Multimedia design tools
- Iterative development process
- Storyboarding techniques and tools
- Hardware, software and operating systems
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Create final system architecture design.

PERFORMANCE CRITERIA

System architecture design is created to be congruent with scope of work and detailed design.

Time to complete the skill varies with the complexity of scope of work.

PERFORMANCE ELEMENTS

1. Review detailed design.
2. Analyze design alternatives.
3. Make tradeoffs and decisions.
4. Formulate new processes.
5. Create storyboard.
6. Document final system design.
7. Obtain approval from appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Final system architecture design is completed and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

COMPLETE USER INTERFACE DESIGN.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Visual design specifications
- Scope of work
- Usability factors
- Interface requirements
- Implementation procedures
- Multimedia software
- Iterative development process
- Design procedures
- Network and online resources
- Company policy and procedure

WORK TO BE PERFORMED

Complete user interface design.

PERFORMANCE CRITERIA

User interface design is completed and approved.

Time to complete the skill varies with the complexity of visual design and usability factors.

PERFORMANCE ELEMENTS

1. Review visual design and usability factors.
2. Analyze design alternatives.
3. Make tradeoffs and decisions.
4. Formulate new processes.
5. Create storyboard.
6. Complete user interface design.
7. Obtain approval from appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

User interface design is completed and approved.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

DOCUMENT NAVIGATION SCHEMA.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Navigation concepts and processes
Navigation schematics
Final system design specifications
User interface design specifications
Multimedia software
Network and online resources
Company policy and procedure

WORK TO BE PERFORMED

Document navigation schema for end user.

PERFORMANCE CRITERIA

Navigation schema is documented and congruent with final system design.

Time to complete the skill varies with the complexity of final system design.

PERFORMANCE ELEMENTS

1. Review final system design and user interface design.
2. Create system navigation schema at appropriate audience level.
3. Communicate results to end user.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Navigation schema is documented and delivered to end user.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

IDENTIFY AVAILABLE MULTIMEDIA CONTENT SOURCES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Visual design specifications
- Scope of work
- Client marketing materials
- Copyright laws and licenses
- Acquisition procedures
- List of vendors
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Identify available multimedia content sources.

PERFORMANCE CRITERIA

Multimedia content sources are identified according to scope of work and visual design requirements.

Time to complete the skill varies with the complexity of scope of work and visual design requirements.

PERFORMANCE ELEMENTS

1. Review visual design and scope of work.
2. Identify required multimedia content.
3. Evaluate available multimedia content resources.
4. Document available multimedia content resources.
5. Distribute resource documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

All copyright laws and licenses are adhered to.

PRODUCT

Multimedia content sources are identified, documented and distributed to appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

IDENTIFY TIMELINE CONSTRAINTS AND PROJECT INTERDEPENDENCIES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Scope of work
Multimedia requirements
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Identify timeline constraints and project interdependencies.

PERFORMANCE CRITERIA

Contingency plans for timeline constraints and project interdependencies are updated and communicated according to company policy and procedures.

Time to complete the skill varies with the complexity of scope of work.

PERFORMANCE ELEMENTS

1. Review scope of work.
2. Identify timeline constraints.
3. Identify project interdependencies.
4. Identify risks.
5. Document constraints, risks and interdependencies.
6. Communicate constraints and interdependencies to appropriate parties.
7. Update contingency plan to reflect changes.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Constraints and interdependencies are identified and communicated to appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

CREATE TEXTUAL CONTENT.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Visual design specifications
- Scope of work
- Usability factors
- Copyright laws and licenses
- Script development techniques
- Multimedia software
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Create textual content.

PERFORMANCE CRITERIA

Textual content is created to be congruent with scope of work and visual design.

Time to complete the skill varies with the complexity of scope of work and visual design.

PERFORMANCE ELEMENTS

1. Review visual design and scope of work.
2. Review usability factors.
3. Create textual content.
4. Proof document and revise as necessary.
5. Obtain approval according to scope of work.
6. Distribute documents to appropriate parties/areas.

PERFORMANCE ASSESSMENT CRITERIA

All copyright laws and licenses are adhered to.

PRODUCT

Textual content is created and approved by customer.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Visual design specifications
- Scope of work
- Usability factors
- Copyright laws and licenses
- List of graphic vendors
- Client marketing materials
- Multimedia software
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Produce or acquire graphics content.

PERFORMANCE CRITERIA

Graphics content is produced or acquired and is consistent with visual design.

Time to complete the skill varies with the complexity of visual design and graphics requirements.

PERFORMANCE ELEMENTS

1. Review visual design and scope of work.
2. Review usability factors.
3. Identify required graphics.
4. Evaluate available graphic resources.
5. Decide to use available resource or create new graphic.
6. Acquire or create graphic.
7. Obtain approval according to scope of work.
8. Distribute graphics to appropriate parties/areas.

PERFORMANCE ASSESSMENT CRITERIA

All copyright laws and licenses are adhered to.

PRODUCT

Graphic content is produced or acquired.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

PRODUCE OR ACQUIRE ANIMATION CONTENT.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Visual design
- Scope of work
- Usability factors
- Client marketing materials
- Copyright laws and licenses
- List of animation vendors
- Multimedia software
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Produce or acquire animation content.

PERFORMANCE CRITERIA

Animation content is produced or acquired and is consistent with visual design.

Time to complete the skill varies with the complexity of visual design and animation requirements.

PERFORMANCE ELEMENTS

1. Review visual design and scope of work.
2. Review usability factors.
3. Identify required animation.
4. Evaluate available animation resources.
5. Decide to use available resource or create new animation.
6. Acquire or create animation.
7. Obtain approval according to scope of work.
8. Distribute animation to appropriate parties/areas.

PERFORMANCE ASSESSMENT CRITERIA

All copyright laws and licenses are adhered to.

PRODUCT

Animation content is produced or acquired.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

PRODUCE OR ACQUIRE AUDIO CONTENT.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Visual design
- Scope of work
- Usability factors
- Client marketing materials
- Copyright laws and licenses
- List of audio vendors
- Multimedia software
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Produce or acquire audio content.

PERFORMANCE CRITERIA

Audio content is produced or acquired and is consistent with visual design.

Time to complete the skill varies with the complexity of visual design and audio requirements

PERFORMANCE ELEMENTS

1. Review visual design and scope of work.
2. Review usability factors.
3. Identify required audio content.
4. Evaluate available audio resources.
5. Decide to use available resource or create new audio content.
6. Acquire or create audio content.
7. Obtain approval according to scope of work.
8. Distribute audio resources to appropriate parties/areas.

PERFORMANCE ASSESSMENT CRITERIA

All copyright laws and licenses are adhered to.

PRODUCT

Audio content is produced or acquired.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

PRODUCE OR ACQUIRE VIDEO CONTENT.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Visual design
- Scope of work
- Usability factors
- Client marketing materials
- Copyright laws and licenses
- List of video vendors
- Multimedia software
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Produce or acquire video content.

PERFORMANCE CRITERIA

Video content is produced or acquired and is consistent with visual design.

Time to complete the skill varies with the complexity of visual design and video requirements.

PERFORMANCE ELEMENTS

1. Review visual design and scope of work.
2. Review usability factors.
3. Identify required video content.
4. Evaluate available video content resources.
5. Decide to use available resource or create new video content.
6. Acquire or create video content.
7. Obtain approval according to scope of work.
8. Distribute video content to appropriate parties/areas.

PERFORMANCE ASSESSMENT CRITERIA

All copyright laws and licenses are adhered to.

PRODUCT

Video content is produced or acquired.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

PRODUCE OR ACQUIRE SIMULATIONS OR VIRTUAL ENVIRONMENTS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Visual design
- Scope of work
- Usability factors
- Client marketing materials
- Copyright laws and licenses
- Virtual reality technology systems
- Simulation and video production tools
- Multimedia software
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Produce or acquire simulations or virtual environments.

PERFORMANCE CRITERIA

Simulation or virtual reality environments are produced or acquired and are consistent with visual design.

Time to complete the skill varies with the complexity of visual design and simulation requirements.

PERFORMANCE ELEMENTS

1. Review visual design and scope of work.
2. Review usability factors.
3. Identify required simulation/virtual reality content.
4. Evaluate available simulation/virtual reality content resources.
5. Decide to use available resource or create new simulation/virtual reality content.
6. Acquire or create simulation/virtual reality content.
7. Obtain approval according to scope of work.
8. Distribute simulation/virtual reality content to appropriate parties/areas.

PERFORMANCE ASSESSMENT CRITERIA

All copyright laws and licenses are adhered to.

PRODUCT

Simulation/virtual reality content is produced or created.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

ORGANIZE COMPONENTS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Scope of work
Flow charts, storyboard and other diagrams
List of functions/features requested/required by users
Components (textual, visual, audio, etc.)
Multimedia software
Hardware, software and operating systems
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Organize components into outline.

PERFORMANCE CRITERIA

Visual outline of product is documented and communicated to appropriate personnel according to company policy and procedures.

All major and minor components are incorporated with 100% accuracy.

Time to complete the skill varies with the complexity of components.

PERFORMANCE ELEMENTS

1. Review components.
2. Classify components as major or minor.
3. Diagram relationship between major and minor components in outline.
4. Verify compatibility of multimedia components.
5. Document and distribute results to appropriate personnel.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Product outline that reflects the structure is produced.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

INCORPORATE FUNCTIONAL DESIGN CRITERIA.

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DEVELOPMENT

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Scope of work
Major and minor component outline
Hardware, software and operating systems
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Incorporate functional design criteria.

PERFORMANCE CRITERIA

Functional design criteria is incorporated according to company policy and procedures.

Time to complete the skill varies with the complexity of scope of work.

PERFORMANCE ELEMENTS

1. Review major and minor component outline.
2. Identify each function and feature within major and minor components.
3. Create preliminary design of functional interfaces.
4. Document and distribute results to appropriate personnel.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Preliminary design of interfaces supports all requested/required functions and features.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

INCORPORATE HUMAN FACTORS INTO FUNCTIONAL DESIGN.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Preliminary functional design specifications
Environmental factors (e.g., noise, light, etc.)
Usability factors
Human factors analyses report
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Incorporate human factors into the functional design.

PERFORMANCE CRITERIA

Human factors are incorporated into the product design according to company policy and procedures.

Time to complete the skill varies with the complexity of the preliminary functional design.

PERFORMANCE ELEMENTS

1. Review functional design.
2. Review environmental factors.
3. Review usability factors.
4. Review human factor analyses.
5. Incorporate factors into product design.
6. Document and distribute recommendations to appropriate personnel.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Human factors are included in final product design.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

ACQUIRE DEVELOPMENT TOOLS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Product design specifications
- Development tools
- Industry trends and defacto standards
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Acquire development tools.

PERFORMANCE CRITERIA

Development tools are selected and made available based upon product needs and according to company policy and procedures.

Time to complete the skill varies with the complexity of existing and proposed requirements.

PERFORMANCE ELEMENTS

1. Review product design.
2. Identify types of development activities to be performed.
3. Review available development tools.
4. Identify additional tools needed.
5. Review network and online resources.
6. Acquire appropriate development tools.
7. Communicate and/or distribute development tools to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Development tools are acquired.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Development tools and techniques
- Industry standards
- Product design specifications
- Existing components list
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Develop product components.

PERFORMANCE CRITERIA

Product components are developed according to product design.

Time to complete the skill varies with the complexity of existing and proposed requirements.

PERFORMANCE ELEMENTS

1. Review product design.
2. Identify required components.
3. List available components.
4. Identify components to be bought.
5. Identify components to be created.
6. Acquire/create components.
7. Document and distribute components to appropriate personnel.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Product components are developed and documentation completed.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

CREATE AND/OR MODIFY SYSTEM INTERFACES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Project plan
- User interface design standards
- System integration issues
- Programming language(s)
- Hardware, software and operating systems
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Create and/or modify system interfaces.

PERFORMANCE CRITERIA

System interfaces are created and/or modified according to project plan.

Time to complete the skill varies with the complexity of project plan.

PERFORMANCE ELEMENTS

1. Review project plan.
2. Review current system interfaces.
3. Determine required changes to system interfaces.
4. Determine if current interfaces can be modified or if new interfaces must be created.
5. Secure tools and equipment.
6. Complete system interface modification or creation.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

System interfaces are created and/or modified.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Product components
Testing tools and procedures
Business requirements
System environments
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Develop test plan for product functionality and usability.

PERFORMANCE CRITERIA

A plan is developed for testing product functionality and usability according to business requirements and resources.

Time to complete the skill varies with the complexity of business requirements and system environment.

PERFORMANCE ELEMENTS

1. Review business requirements.
2. Review components' functionality.
3. Review tools and procedures.
4. Identify scope and applicability of test based upon test points and business requirements.
5. Develop test plan that includes the following elements
   a. Tasks
   b. Time
   c. Location
   d. Required resources
   e. Anticipated test results
   f. Responsibilities
6. Document and distribute test plan to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Test plan is developed.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

IDENTIFY TEST PLAN RESOURCES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Test plan
- Testing resources
- Personnel
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Identify resources to complete test plan.

PERFORMANCE CRITERIA

Required resources are identified and planned according to test plan tasks.

Time to complete the skill varies with the complexity of testing resources required.

PERFORMANCE ELEMENTS

1. Review test plan.
2. Classify types of skills needed.
3. Select personnel based on skill set.
4. Identify required system resources.
5. Match required resources with test plan tasks.
6. Negotiate availability of personnel and system resources.
7. Document and distribute resource information to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Resources for test plan are identified and reserved.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

ADMINISTER PRODUCT TESTING.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Test plan
- Testing resources
- Personnel
- Resource information
- Scope of work
- Company testing procedures
- System resources
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Administer product testing.

PERFORMANCE CRITERIA

Product testing is scheduled according to company testing procedures.

Time to complete the skill varies with the complexity of the test plan.

PERFORMANCE ELEMENTS

1. Review test plan.
2. Schedule test activities.
3. Verify test equipment/environment is prepared.
4. Administer test tasks.
5. Document and distribute test results to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Product testing is administered.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

ANALYZE RESULTS OF TEST.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Test plan, including anticipated results
Test schedule
Test environment and resources
Test assessment and reporting standards
Test results
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Analyze results of test.

PERFORMANCE CRITERIA

Product is tested and results evaluated according to test plan.

Time to complete the skill varies with the complexity of the test plan and test environment.

PERFORMANCE ELEMENTS

1. Review test plan and test schedule.
2. Review actual results.
3. Record differences between actual results and anticipated results.
4. Analyze differences to determine cause.
5. Document and distribute test results to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Test results are analyzed and evaluated.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

RESOLVE IDENTIFIED PROBLEMS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- List of identified problems
- Test results
- Diagnostic tools
- Problem tracking tools
- Problem-solving resources
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Resolve identified problems.

PERFORMANCE CRITERIA

Identified problems are resolved according to company policy and procedures.

Time to complete the skill varies with type and complexity of identified problems.

PERFORMANCE ELEMENTS

1. Review identified test problems/results.
2. Record problems into tracking tool.
3. Identify potentially related problems.
4. Use diagnostic tools to determine source of problem.
5. Correct problem.
6. Retest affected components using skills 56-58.
7. Record retest results using skill 59.
8. Document and distribute test results to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Identified problems are corrected.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

ACCESS IMPACT OF PRODUCT ON CURRENT SYSTEM.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Product to be assessed
Current systems and interfaces
System measurement tools
Current system performance measurements
List of integration testing parameters
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Assess impact of product on current system.

PERFORMANCE CRITERIA

Impact on the system is assessed using performance and integration testing.

Time to complete the skill varies with the complexity of product and testing required.

PERFORMANCE ELEMENTS

1. Review current system performance measurements.
2. Conduct system integration testing.
3. Identify sources of system integration problems.
4. Conduct volume/performance testing.
5. Compare system (including new product) performance measurements to previous system performance measurements.
6. Identify sources of system performance degradation.
7. Determine potential solutions to performance and integration issues.
8. Select and implement solutions to performance and integration issues.
9. Determine "go/no go" to product production.
10. Document and distribute results to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Impact of product on current system is assessed and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

DEVELOP PRODUCTION PLAN.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Backup procedures
- Scope of work
- System interdependency analysis
- Distribution requirements/alternatives
- Client hardware/software environment
- Client policies and procedures
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Develop production plan.

PERFORMANCE CRITERIA

Production plan is developed and documented according to company policy and procedures.

Time to complete the skill varies with the complexity of scope of work.

PERFORMANCE ELEMENTS

1. Review scope of work and client hardware/software environment.
2. Review client policies and procedures.
3. Review system interdependencies.
4. Identify key resources.
5. Document production plan.
6. Identify risks.
7. Develop contingency plans.
8. Complete production plan.
9. Distribute plan to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Production plan is developed and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

SCHEDULE PRODUCTION TRAINING.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Production plan
- Contingency plan
- Scope of work
- Project documentation
- Backup procedures
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Schedule production training.

PERFORMANCE CRITERIA

Production training is scheduled according to company policy and procedures.

Time to complete the skill varies with the complexity of production plan and training requirements.

PERFORMANCE ELEMENTS

1. Review production plan, project documentation and contingency plan.
2. Assess training needs.
3. Identify training resources.
4. Match required resources with training needs.
5. Negotiate availability of personnel and resources.
6. Schedule training sessions.
7. Document and distribute training information to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Production training is scheduled.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Production plan
Training schedule
Training resources
Training environment
Scope of work
Project documentation
Backup procedures
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Conduct production training.

PERFORMANCE CRITERIA

Production training is conducted according to company policy and procedures.

Time to complete the skill varies with the complexity of production plan and training requirements.

PERFORMANCE ELEMENTS

1. Review training schedule and production plan.
2. Assess training needs.
3. Verify training resources/environment is prepared.
4. Direct training activities.
5. Collect training feedback.
6. Document and distribute training results to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Production training is conducted.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

EVALUATE PRODUCTION TRAINING.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Production plan
- Scope of work
- Training schedule
- Training resources
- Training feedback
- Project documentation
- Backup procedures
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Evaluate production training.

PERFORMANCE CRITERIA

Production training is evaluated according to company policy and procedures.

Time to complete the skill varies with the complexity of production plan and training requirements.

PERFORMANCE ELEMENTS

1. Review production plan, training resources, schedule and feedback.
2. Record differences between training results and anticipated results.
3. Analyze differences to determine cause.
4. Document and distribute recommendations to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Production training feedback is evaluated.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

EXECUTE PRODUCTION IMPLEMENTATION PLAN.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Backup procedures
- Production plan
- Production log
- Scope of work
- Required resources
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Execute production implementation plan.

PERFORMANCE CRITERIA

Production implementation plan is completed according to company policy and procedures.

Time to complete the skill varies with the complexity of implementation plan.

PERFORMANCE ELEMENTS

1. Review production implementation plan.
2. Secure required resources.
3. Explain production implementation plan to client.
4. Complete implementation.
5. Fill out implementation log.
6. Distribute implementation plan to appropriate parties.
7. Complete backup procedures.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Production implementation plan is completed.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

EVALUATE PRODUCTION IMPLEMENTATION RESULTS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Production plan
Production log
Scope of work
Company evaluation procedures
Company policy and procedures

WORK TO BE PERFORMED

Evaluate production implementation results.

PERFORMANCE CRITERIA

Production implementation results are evaluated according to company policy and procedures.

Time to complete the skill varies with the complexity of production plan and evaluation requirements.

PERFORMANCE ELEMENTS

1. Review production implementation log.
2. Evaluate system performance.
3. Evaluate performance of new technology.
4. Evaluate impact of implementation on existing system.
5. Discuss/review implementation with client.
6. Document and distribute findings to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Production implementation results are evaluated and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

PERFORM TRAINING NEEDS ASSESSMENT.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Technical information resources
- Usability factors
- Scope of work
- Product specifications
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Perform training needs assessment.

PERFORMANCE CRITERIA

Training needs assessment is completed according to company policy and procedures.

Time to complete the skill varies with the complexity of product specifications and audience.

PERFORMANCE ELEMENTS

1. Review product specifications and technical information.
2. Identify expected product users.
3. Identify audiences' knowledge and skill gaps.
   a. Prior knowledge/skill of similar products.
   b. Prior knowledge/skill of impacted system components.
   c. Knowledge/skill required for new product.
4. Identify training environment, requirements and constraints.
5. Document and distribute needs analysis to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Training needs assessment is documented and distributed to appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

DEFINE LEARNING OBJECTIVES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Technical information
- Needs assessment
- Usability factors
- Scope of work
- Product specifications
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Define learning objectives.

PERFORMANCE CRITERIA

Learning objectives are defined to include the knowledge and skills to be demonstrated by the users.

Time to complete the skill varies with the complexity of needs assessment.

PERFORMANCE ELEMENTS

1. Review needs assessment.
2. Identify critical and essential knowledge/skills.
3. Define knowledge/skills in measurable terms (e.g., observable, within time constraints, etc.).
4. Document learning objectives.
5. Distribute learning objectives to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Learning objectives are defined.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

DETERMINE TRAINING DELIVERY METHOD.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Technical information
- Learning objectives
- Needs assessment
- Usability factors
- Scope of work
- Product specifications
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Determine training delivery method.

PERFORMANCE CRITERIA

Training delivery method is determined according to company policy and procedures.

Time to complete the skill varies with the complexity of product specifications.

PERFORMANCE ELEMENTS

1. Review learning objectives and needs assessment.
2. Review available/required resources (e.g., time, facilities, systems, personnel, skill set, etc.).
3. Identify training options (e.g., build/buy, instructor lead vs. self-study, delivery methods, etc.) and requirements/costs related to each option.
4. Provide recommendation and alternatives/tradeoffs to appropriate parties.
5. Document selected training option based on appropriate parties' feedback.
6. Distribute selection according to company policy and procedures.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Training delivery method is selected.

PROCESS

The performance elemen[illegible]re [illegible]mbered to show an appropriate sequence for completing the skill; hov[illegible]er, a different sequence may be used.

DEVELOP LEARNING ASSESSMENTS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Technical information
- Training delivery method
- Learning objectives
- Needs assessment
- Usability factors
- Scope of work
- Product specifications
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Develop learning assessments.

PERFORMANCE CRITERIA

Learning assessments are developed according to company policy and procedures.

Time to complete the skill varies with the complexity of delivery method and learning objectives.

PERFORMANCE ELEMENTS

1. Review learning objectives and training delivery method.
2. Determine assessment options based on delivery method.
3. Select assessment options for each learning objective.
4. Establish performance criteria (e.g., pass vs. fail, scale, acceptable/unacceptable performance, etc.).
5. Pilot-test assessment items with experienced users.
6. Revise assessment items based on pilot test.
7. Document learning assessments.
8. Distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Learning assessments are developed and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Technical information
- Training delivery method
- Learning assessments
- Learning objectives
- Needs assessment
- Usability factors
- Scope of work
- Product specifications
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Acquire/develop training materials for new hardware/software.

PERFORMANCE CRITERIA

Training materials are developed according to company policy and procedures.

Time to complete the skill varies with the complexity of delivery method and type of training materials required.

PERFORMANCE ELEMENTS

1. Review training delivery method, learning objectives and assessments.
2. Create training outline.
3. Select/develop training media to match each learning objective.
4. Organize training media based on training outline.
5. Create training content, incorporating training media.
6. Determine placement of assessment items.
7. Perform training demo with team members and/or appropriate personnel.
8. Revise training materials based on input.
9. Pilot-test training materials with experienced users.
10. Revise training materials based on pilot test.
11. Distribute training materials to appropriate parties for approval (e.g., team members, supervisor, customer, etc.).

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Training materials are developed and approved by appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

CONDUCT TRAINING SESSION.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Technical information
- Training delivery method
- Training materials
- Feedback mechanisms
- Usability factors
- Scope of work
- Product specifications
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Conduct training session.

PERFORMANCE CRITERIA

Training session is conducted according to company policy and procedures.

Time to complete the skill varies with the complexity of delivery method and training materials.

PERFORMANCE ELEMENTS

1. Review training materials and delivery method.
2. Identify training delivery resources.
3. Organize training logistics (e.g., facilities, time, production/distribution of materials, etc.).
4. Communicate training information to appropriate parties.
5. Obtain/create feedback mechanisms.
6. Present training materials to audience.
7. Collect feedback from audience.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Training is delivered as scheduled.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Technical information
- Training delivery method
- Training materials
- Feedback forms
- Product specifications
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Evaluate effectiveness of training.

PERFORMANCE CRITERIA

Effectiveness of training is evaluated according to company policy and procedures.

Time to complete the skill varies with the complexity of delivery method and amount of feedback.

(Example: Time to evaluate training with 10 one-page feedback documents is 60 minutes.)

PERFORMANCE ELEMENTS

1. Review and analyze feedback forms.
2. Identify common issues.
3. Identify source of issue.
4. Determine corrective action as needed.
5. Document and distribute results to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Effectiveness of training is evaluated.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

PUBLISH PROBLEM SOLUTIONS IN KNOWLEDGE BASE.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Call tracking software/reports
Documented problems and resolutions
Knowledge base guidelines
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Publish problem solutions in knowledge base.

PERFORMANCE CRITERIA

Problem solutions are written according to company policy and procedures.

Time to complete the skill varies with the complexity of problem issues and solution requirements.

PERFORMANCE ELEMENTS

1. Identify recurring problems.
2. Review current knowledge base for identified problem.
3. Develop or modify solution if needed.
4. Publish solution into knowledge base according to company policy and procedures.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Problem solution is published into knowledge base.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

PREPARE CUSTOMER-ORIENTED SOLUTION SUMMARY.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Technical vocabulary
- Call tracking software/reports
- Recorded problem and solution
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Prepare customer-oriented solution summary.

PERFORMANCE CRITERIA

Customer-oriented solution is prepared according to company policy and procedures.

Time to complete the skill varies with the complexity of existing and proposed requirements.

PERFORMANCE ELEMENTS

1. Review problem description and solution.
2. Translate solution into understandable terms for target audience.
3. Verify customers' understanding of solution.
4. Update problem record.
5. Document and distribute results of appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Problem solution is presented to customer at appropriate audience level.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

DEFINE SCOPE OF PROJECT.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Customer request
Project scenarios
Project management tools
Applicable standards, regulations and laws
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Define scope of project.

PERFORMANCE CRITERIA

The size and specifics of project are documented according to company policy and procedures.

Time to complete the skill varies with the complexity of existing and proposed requirements

PERFORMANCE ELEMENTS

1. Review customer request.
2. Identify business problem/goal.
3. Identify desired outcomes/results.
4. Document and distribute results to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Scope of project is documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

IDENTIFY STAKEHOLDERS, DECISION MAKERS AND ESCALATION PROCEDURES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Scope of project
- Project scenarios
- Customer request
- Project management tools
- Applicable standards, regulations and laws
- Network and online resources
- Company policy and procedure

WORK TO BE PERFORMED

Identify stakeholders, decision makers and escalation procedures.

PERFORMANCE CRITERIA

Stakeholders, decision makers and escalation procedures are identified according to company policy and procedures.

Time to complete the skill varies with the complexity of scope of project.

PERFORMANCE ELEMENTS

1. Review scope of project and customer request.
2. Identify impacted parties/businesses (stakeholders).
3. Identify decision makers.
4. Identify escalation procedures.
5. Prepare project summary statement.
6. Review with appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Stakeholders, decision makers and escalation procedures are identified.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

DEVELOP TASK LIST.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Scope of project
- Project scenarios
- Customer request
- Project management tools
- Applicable standards, regulations and laws
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Develop task list.

PERFORMANCE CRITERIA

Task list is developed for the project according to company policy and procedures.

Time to complete the skill varies with the complexity of existing and proposed requirements.

PERFORMANCE ELEMENTS

1. Review scope of project.
2. Identify tasks for scope of project.
3. Identify responsible parties for each task.
4. Identify initial task sequence.
5. Document and distribute task list to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Task list is completed for scope of project.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

IDENTIFY REQUIRED RESOURCES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Scope of project
Project scenarios
Customer request
Task list
Project management tools
Applicable standards, regulations and laws
Network and online resources
Company policy and procedures

WORK TO BE PERFORMED

Identify required resources.

PERFORMANCE CRITERIA

Required resources are identified according to company policy and procedures.

Time to complete the skill varies with the complexity of existing and proposed requirements.

PERFORMANCE ELEMENTS

1. Review scope of project and task list.
2. Identify required skill sets per task.
3. Identify required types of resources (e.g., facilities, systems, personnel, etc.) per tasks.
4. Estimate number of resources by type.
5. Estimate availability of resources.
6. Document and distribute required resources to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Required resources are identified and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Scope of project
- Project scenarios
- Customer request
- Task list
- Required resources
- Project management tools
- Applicable standards, regulations and laws
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Estimate time requirements for each task.

PERFORMANCE CRITERIA

Time estimate requirements are completed according to company policy and procedures.

Time to complete the skill varies with the complexity of existing and proposed requirements.

PERFORMANCE ELEMENTS

1. Review task list and scope of project.
2. Determine constraints for required resources.
3. Estimate time required for each task based on experience or prior knowledge.
4. Document and distribute time requirements to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Time estimate requirements are documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Scope of project
- Estimated time requirements
- Required resources
- Risk analysis tools
- Company policy and procedures

WORK TO BE PERFORMED

Schedule change according to risk.

PERFORMANCE CRITERIA

Change is scheduled according to company policy and procedures.

Time to complete the skill varies with the complexity of existing and proposed requirements.

PERFORMANCE ELEMENTS

1. Review scope of project.
2. Identify peak/nonpeak system (times).
3. Determine maximum time available/required to complete change.
4. Distribute proposed schedule to appropriate parties for approval.
5. Document approved schedule and distribute.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Complete contingency plans are submitted to appropriate parties and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

PERFORM CAPACITY AND RESOURE PLANNING.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Scope of project
- Data analysis tools
- Data collection systems
- Personnel resources
- Projected business change requirements
- Existing system capacity and resources
- Proposed enhancements
- Hardware, software and operating systems
- Company policy and procedures

WORK TO BE PERFORMED

Perform capacity and resource planning.

PERFORMANCE CRITERIA

Capacity and resource planning is completed according to company policy and procedures. Assessments of capacity issues surrounding the impact of new technologies, applications, etc., are identified and estimated.

Time to complete the skill varies with the complexity of scope of project.

PERFORMANCE ELEMENTS

1. Review scope of project.
2. Review current system capacity/resources.
3. Determine capacity/resources required by proposed enhancements.
4. Determine additional capacity/resources required.
5. Document and distribute planning results to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Capacity/resource issues are performed and distributed to appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

TRACK CRITICAL MILESTONES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Tracking tools
- Scope of project
- Project schedule
- System impacts
- Hardware, software and operating systems
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Track critical milestones.

PERFORMANCE CRITERIA

Critical milestones are documented and schedule revisions suggested according to company policy and procedures and scope of work.

Time to complete the skill varies with the complexity of scope of work and project schedule.

PERFORMANCE ELEMENTS

1. Review scope of project.
2. Review project schedule.
3. Identify project milestones.
4. Determine project schedule revisions as needed.
5. Review schedule with appropriate parties.
6. Document milestones and changes.
7. Distribute tracking results to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Project milestones are documented and communicated to appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

SECURE REQUIRED RESOURCES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Required resources
- Resource acquisition reports
- Scope of project
- Project schedule
- Request/acquisition forms
- Industry standards and constraints
- Hardware, software and operating systems
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Secure required resources.

PERFORMANCE CRITERIA

Required resources are secured according to project schedule and company policy and procedures.

Time to complete the skill varies with the complexity of scope of project and project schedule.

PERFORMANCE ELEMENTS

1. Review scope of project and project schedule.
2. Review required resource listing.
3. Identify additional resource needs.
4. Complete request/acquisition paperwork.
5. Distribute required resources to appropriate parties.
6. Obtain required resources.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Resources are secured.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

MANAGE CHANGE CONTROL PROCESS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Project plan
- Change request form and instructions
- Personnel resources
- Potential impact on system
- Hardware, software and operating systems
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Manage change control process.

PERFORMANCE CRITERIA

Change control process is managed according to company policy and procedures.

Time to complete the skill varies with the complexity of project plan.

PERFORMANCE ELEMENTS

1. Review project plan.
2. Analyze change request.
3. Accept or deny change request.
4. Document reasons for acceptance/rejection.
5. Distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Change requests are reviewed and decision documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

REPORT PROJECT STATUS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Project plan
- Project schedule
- Critical milestone report
- Approved change requests and impacts
- Task progress and status reports
- Hardware, software and operating systems
- Network and online resources
- Company policy and procedures

WORK TO BE PERFORMED

Report project status.

PERFORMANCE CRITERIA

Project status is documented and communicated to appropriate parties according to project plan and company policy and procedures.

Time to complete the skill varies with the complexity of project plan.

PERFORMANCE ELEMENTS

1. Review project plan and schedule.
2. Examine appropriate reports.
3. Review status with project leaders.
4. Document project status and distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Project status is documented and communicated to appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill; however, a different sequence may be used.

Network and Online Resources	Resources for product development that include, but are not limited to, the intranet, internet, LAN, etc.
Physical Requirements	The space allocation requirements that are necessary to host/house proposed new equipment.
System Requirements	The technical specifications required by the proposed hardware and/or software to properly communicate with the existing system.
System Development Life Cycle (SDLC)	The methodology used for project planning, development, implementation and support of system projects. The methodology phases include: define requirements, design, build, test and implement.
Human Factors	Identification of symbols, use of colors, language, etc. that is widely recognizable and not offensive or insulting to end users.
Usability Factors	The features, requirements, etc. as specified by the client and/or team members for the implementation and/or use of new hardware/software.
Team Members	Includes all parties involved in the project (e.g., client, staff, other divisions, etc.)
Multimedia	Computer-based technologies such as full motion video, animation and high-quality images that are used to create, integrate and present electronic information beyond the conventional text and graphic formats.

Academic Skills	Skills (and related knowledge) contained in the subject areas and disciplines addressed in most national and state educational standards, including English, mathematics, science, etc.
Assessment	A process of measuring performance against a set of standards through examinations, practical tests, performance observations and/or the completion of work portfolios.
Content Standard	A specification of what someone should know or be able to do to successfully perform a work activity or demonstrate a skill.
Critical Work Functions	Distinct and economically meaningful sets of work activities critical to a work process or business unit which are performed to achieve a given work objective with work outputs that have definable performance criteria. A critical work function has three major components: · **Conditions of Performance:** The information, tools, equipment and other resources provided to a person for a work performance. · **Work to Be Performed:** A description of the work to be performed. · **Performance Criteria:** The criteria used to determine the required level of performance. These criteria could include product characteristics (e.g., accuracy levels, appearance, etc.), process or procedure requirements (e g., safety, standard professional procedures, etc.) and time and resource requirements. The IOSSCC requires that these performance criteria be further specified by more detailed individual performance elements and assessment criteria.
Credentialing	The provision of a certificate or award to an individual indicating the attainment of a designated set of knowledge and skills and/or the demonstration of a set of critical work functions for an industry/occupational area.
Illinois Occupational Skill Standards and Credentialing Council (IOSSCC)	Legislated body representing business and industry which establishes skill standards criteria, endorses final products approved by the industry subcouncil and standards development committee and assists in marketing and dissemination of occupational skill standards.
Industry	Type of economic activity, or product or service produced or provided in a physical location (employer establishment). They are usually defined in terms of the Standard Industrial Classification (SIC) system.

Industry Subcouncil	Representatives from business/industry and education responsible for identifying and prioritizing occupations for which occupational performance skill standards are adapted, adopted or developed. They establish standards development committees and submit developed skill standards to the IOSSCC for endorsement. They design marketing plans and promote endorsed skill standards across the industry.
Knowledge	Understanding the facts, principles, processes, methods and techniques related to a particular subject area, occupation or industry.
Occupation	A group or cluster of jobs, sharing a common set of work functions and tasks, work products/services and/or worker characteristics. Occupations are generally defined in terms of a national classification system including the Standard Occupational Classification (SOC), Occupational Employment Statistics (OES) and the Dictionary of Occupational Titles (DOT).
Occupational Cluster	Grouping of occupations from one or more industries that share common skill requirements.
Occupational Skill Standards	Specifications of content and performance standards for critical work functions or activities and the underlying academic, workplace and occupational knowledge and skills needed for an occupation or an industry/occupational area.
Occupational Skills	Technical skills (and related knowledge) required to perform the work functions and activities within an occupation.
Performance Standard	A specification of the criteria used to judge the successful performance of a work activity or the demonstration of a skill.
Product Developer	Individual contracted to work with the standard development committee, state liaison, industry subcouncil and IOSSCC for the adaptation, adoption or development of skill standards content.
Reliability	The degree of precision or error in an assessment system so repeated measurements yield consistent results.

Skill	A combination of perceptual, motor, manual, intellectual and social abilities used to perform a work activity.
Skill Standard	Statement that specifies the knowledge and competencies required to perform successfully in the workplace.
Standards Development Committee	Incumbent workers, supervisors and human resource persons within the industry who perform the skills for which standards are being developed. Secondary and postsecondary educators are also represented on the committee. They identify and verify occupational skill standards and assessment mechanisms and recommend products to the industry subcouncil for approval.
State Liaison	Individual responsible for communicating information among all parties (e.g., IOSSCC, subcouncil, standard development committee, product developer, project director, etc.) in skill standard development.
Third-Party Assessment	An assessment system in which an industry-designated organization (other than the training provider) administers and controls the assessment process to ensure objectivity and consistency. The training provider could be directly involved in the assessment process under the direction and control of a third-party organization.
Validity	The degree of correspondence between performance in the assessment system and job performance.
Workplace Skills	The generic skills essential to seeking, obtaining, keeping and advancing in any job. These skills are related to the performance of critical work functions across a wide variety of industries and occupations including problem solving, leadership, teamwork, etc.

APPENDIX C

ILLINOIS OCCUPATIONAL SKILL STANDARDS AND CREDENTIALING COUNCIL

Margaret Blackshere	AFL-CIO
Skip Douglas	Lucent Technologies
Judith Hale	Hale Associates
Terry Hoyland	Caterpillar University Caterpillar, Inc.
Michael O'Neill	Chicago Building Trades Council
Janet Payne	United Samaritans Medical Center
Gene Rupnik	Hospitality Industry
Jim Schultz	Illinois Retail Merchants Association Walgreen Company

Larry Benda	Training Manager Madden Communications
Doug Dougherty	President Illinois Telephone Association
Mike Gilley	Business Development Manager Hewlett Packard
Ron Hawks	Education Director Graphics Communication International Union (GCIU)
John Highhouse	Program Director Lincoln Trail College, South Campus
Grey Holcomb	Director of Human Resources Karmak, Inc.
Jeff King	Education Representative Microsoft, Inc.
Lyle Dennis	President/CEO Illinois Broadcasters Association
John Maxson	Executive Vice-President Speedcolor, Inc.
Larry Miller	Director of Switch Engineering Illinois Consolidated Communications
Daniel A. Reed	Head of Department of Computer Science University of Illinois at Urbana-Champaign
Candace Renwall	Executive Director Chicago Software Association
Dennis Sienko	Executive Director AEA
Greg Sutton	President Terasys
Ron Engstrom	State Liaison Illinois State Board of Education

APPENDIX E

INFORMATION TECHNOLOGY DESIGN/BUILD CLUSTER STANDARDS DEVELOPMENT COMMITTEE

Deborah Barrett	Darien, IL
Pam Brewer	Danville VOTEC
Kim Brown	Karmak, Inc. - Carlinville, IL
Douglas Cash	Terasys, Inc. – DuQuoin, IL
Jenni Dahl	Springfield Public Schools
Jan East	State Farm – Bloomington, IL
Mike Gilley	Hewlett-Packard – Naperville, IL
Anu Gokhale	Illinois State University
Larry Jeralds	Southern Illinois University-Carbondale
Sam Kamin	University of Illinois Urbana
Brian Lennox	State Farm – Bloomington, IL
Mark Montgomery	Terasys, Inc. – Naperville, IL
Steve Quinn	DuQuoin, IL
Kenneth Ramsey	EDS, Maryland Heights, MO
Frank Scobby	Southern Illinois University – Carbondale, IL
Robert Shaw	Heartland Community College
Roland Spaniol	Charleston, IL
Greg Sutton	President, Terasys, Inc. – Naperville, IL
Johnny tenBroek	Heartland Community College
Randy von Liski	Illinois Technology Office
Earl Godt	Product Developer Spoon River College
Ron Engstrom	State Liaison Illinois State Board of Education

A. Developing an Employment Plan	1.	Match interests to employment area.
	2.	Match aptitudes to employment area.
	3.	Identify short-term work goals.
	4.	Match attitudes to job area.
	5.	Match personality type to job area.
	6.	Match physical capabilities to job area.
	7.	Identify career information from counseling sources.
	8.	Demonstrate a drug-free status.
B. Seeking and Applying for Employment Opportunities	1.	Locate employment opportunities.
	2.	Identify job requirements.
	3.	Locate resources for finding employment.
	4.	Prepare a resume.
	5.	Prepare for job interview.
	6.	Identify conditions for employment.
	7.	Evaluate job opportunities.
	8.	Identify steps in applying for a job.
	9.	Write job application letter.
	10.	Write interview follow-up letter.
	11.	Complete job application form.
	12.	Identify attire for job interview.
C. Accepting Employment	1.	Apply for social security number.
	2.	Complete state and federal tax forms.
	3.	Accept or reject employment offer.
	4.	Complete employee's Withholding Allowance Certificate Form W-4.
D. Communicating on the Job	1.	Communicate orally with others.
	2.	Use telephone etiquette.
	3.	Interpret the use of body language.
	4.	Prepare written communication.
	5.	Follow written directions.
	6.	Ask questions about tasks.
E. Interpreting the Economics of Work	1.	Identify the role of business in the economic system.
	2.	Describe responsibilities of employee.
	3.	Describe responsibilities of employer or management.
	4.	Investigate opportunities and options for business ownership.
	5.	Assess entrepreneurship skills.
F. Maintaining Professionalism	1.	Participate in employment orientation.
	2.	Assess business image, products and/or services.
	3.	Identify positive behavior.
	4.	Identify company dress and appearance standards.
	5.	Participate in meetings in a positive and constructive manner.
	6.	Identify work-related terminology.
	7.	Identify how to treat people with respect.

G. Adapting to and Coping with Change	1.	Identify elements of job transition.
	2.	Formulate a transition plan.
	3.	Identify implementation procedures for a transition plan.
	4.	Evaluate the transition plan.
	5.	Exhibit ability to handle stress.
	6.	Recognize need to change or quit a job.
	7.	Write a letter of resignation.
H. Solving Problems and Critical Thinking	1.	Identify the problem.
	2.	Clarify purposes and goals.
	3.	Identify solutions to a problem and their impact.
	4.	Employ reasoning skills.
	5.	Evaluate options.
	6.	Set priorities.
	7.	Select and implement a solution to a problem.
	8.	Evaluate results of implemented option.
	9.	Organize workloads.
	10.	Assess employer and employee responsibility in solving a problem.
I. Maintaining a Safe and Healthy Work Environment	1.	Identify safety and health rules/procedures.
	2.	Demonstrate the knowledge of equipment in the workplace.
	3.	Identify conservation and environmental practices and policies.
	4.	Act during emergencies.
	5.	Maintain work area.
	6.	Identify hazardous substances in the workplace.
J. Demonstrating Work Ethics and Behavior	1.	Identify established rules, regulations and policies.
	2.	Practice cost effectiveness.
	3.	Practice time management.
	4.	Assume responsibility for decisions and actions.
	5.	Exhibit pride.
	6.	Display initiative.
	7.	Display assertiveness.
	8.	Demonstrate a willingness to learn.
	9.	Identify the value of maintaining regular attendance.
	10.	Apply ethical reasoning.
K. Demonstrating Technological Literacy	1.	Demonstrate basic keyboarding skills.
	2.	Demonstrate basic knowledge of computing.
	3.	Recognize impact of technological changes on tasks and people.
L. Maintaining Interpersonal Relationships	1.	Value individual diversity.
	2.	Respond to praise or criticism.
	3.	Provide constructive praise or criticism.
	4.	Channel and control emotional reactions.
	5.	Resolve conflicts.
	6.	Display a positive attitude.
	7.	Identify and react to sexual intimidation/harassment.
M. Demonstrating Teamwork	1.	Identify style of leadership used in teamwork.
	2.	Match team member skills and group activity.
	3.	Work with team members.
	4.	Complete a team task.
	5.	Evaluate outcomes.

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